US007080882B2

(12) **United States Patent**
Stitt

(10) **Patent No.: US 7,080,882 B2**
(45) **Date of Patent: Jul. 25, 2006**

(54) **SEAT LOCK**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/011,592**

(22) Filed: **Dec. 14, 2004**

(65) **Prior Publication Data**

US 2006/0138818 A1 Jun. 29, 2006

(51) **Int. Cl.**
A47C 31/00 (2006.01)

(52) **U.S. Cl.** **297/217.3**; 297/335

(58) **Field of Classification Search** 297/217.3, 297/335, 331, 463.2, 463.1, 378.12; 70/261
See application file for complete search history.

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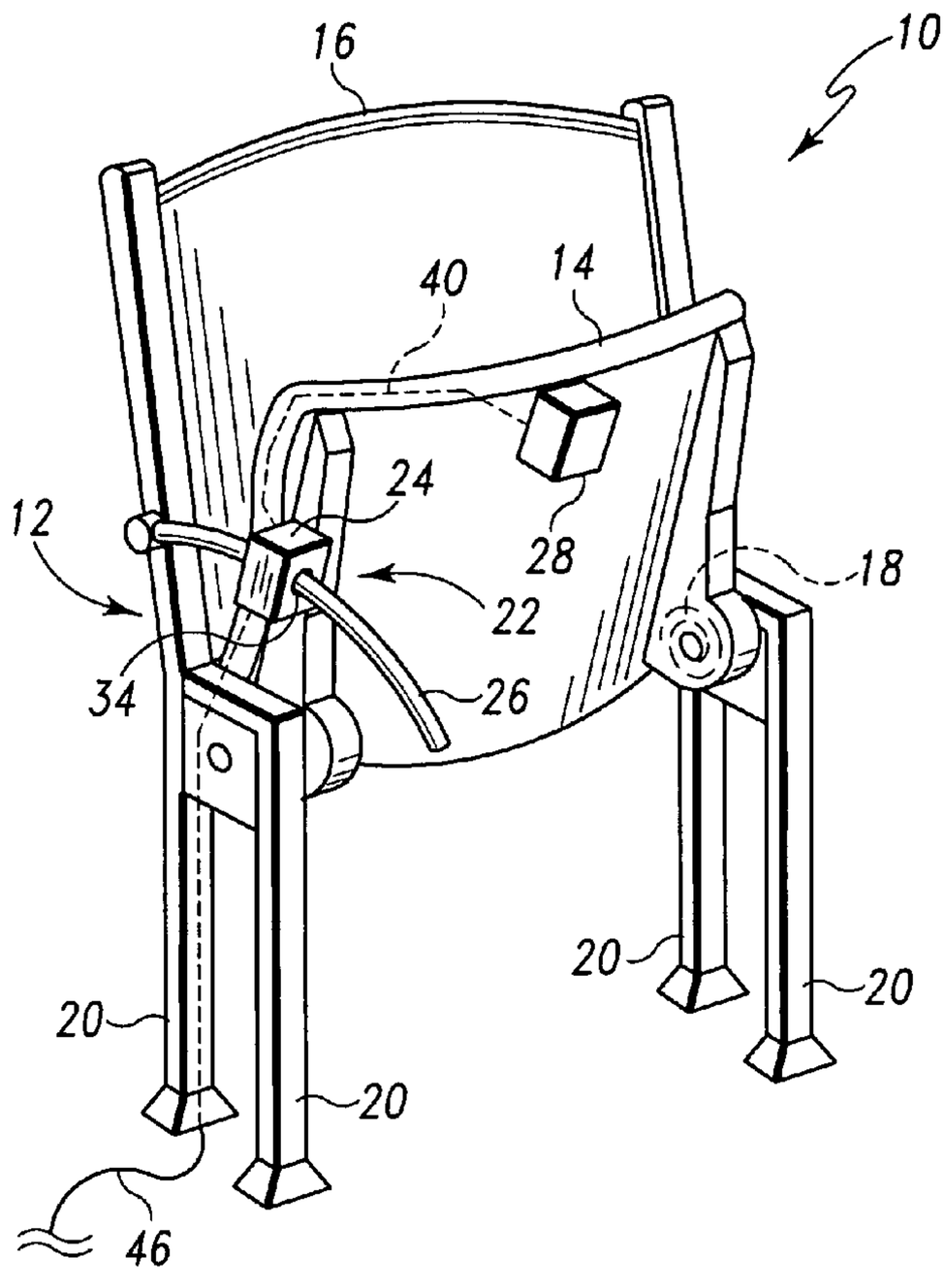
(57) **ABSTRACT**

An apparatus is disclosed for inhibiting an unauthorized person from occupying a seat. According to one aspect, a lock is operatively attached to the seat of a foldable chair to prevent unfolding of the chair. Further, the lock allows the chair to unfold upon obtaining an input code that matches an unlock code.

According to another aspect, a blocking member is positioned to block a person from comfortably sitting in a chair. The blocking member can be repositioned to unblock the person from comfortably sitting in the chair upon obtaining an input code that matches an activation code.

16 Claims, 3 Drawing Sheets



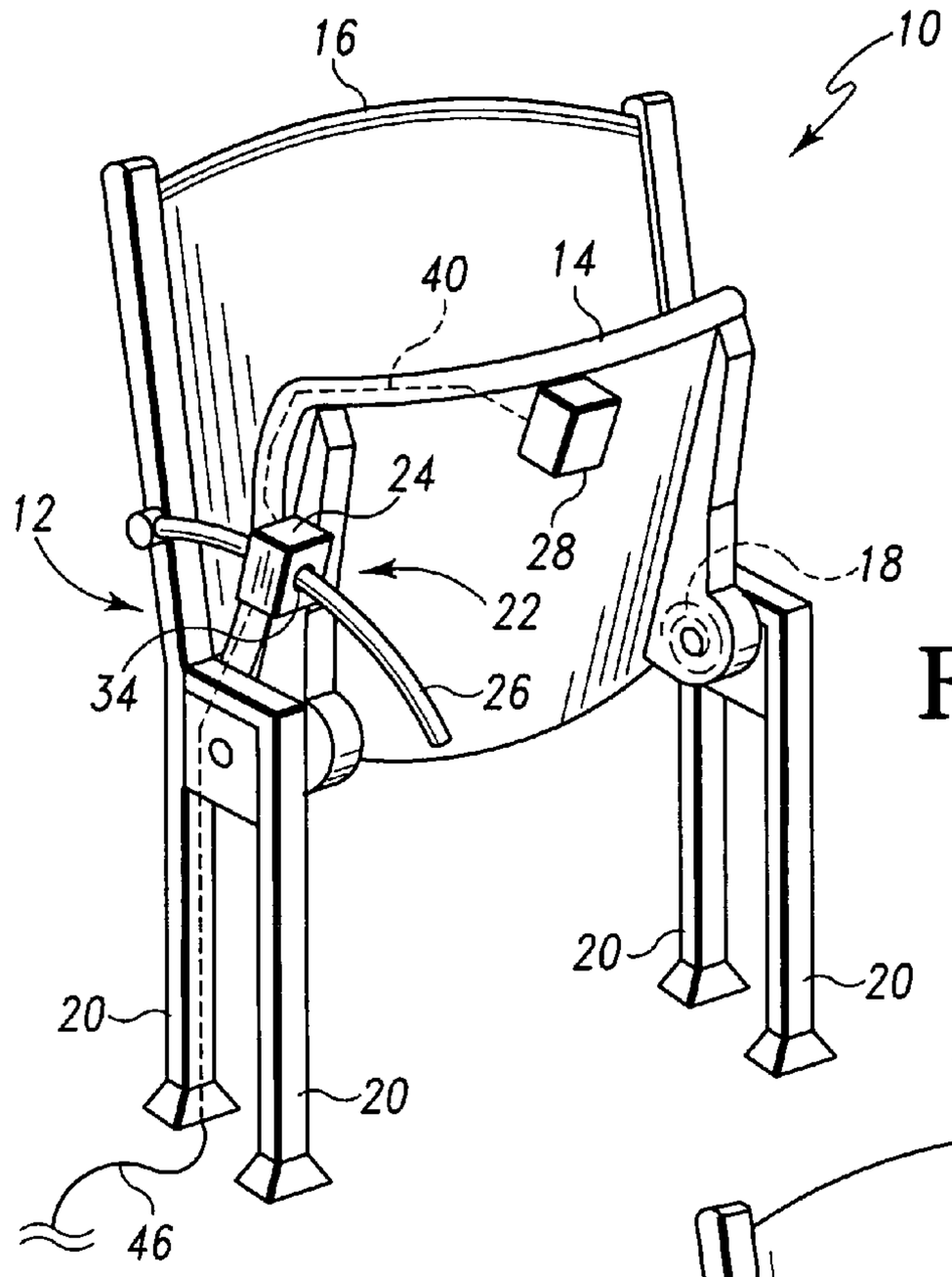

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Fig. 1

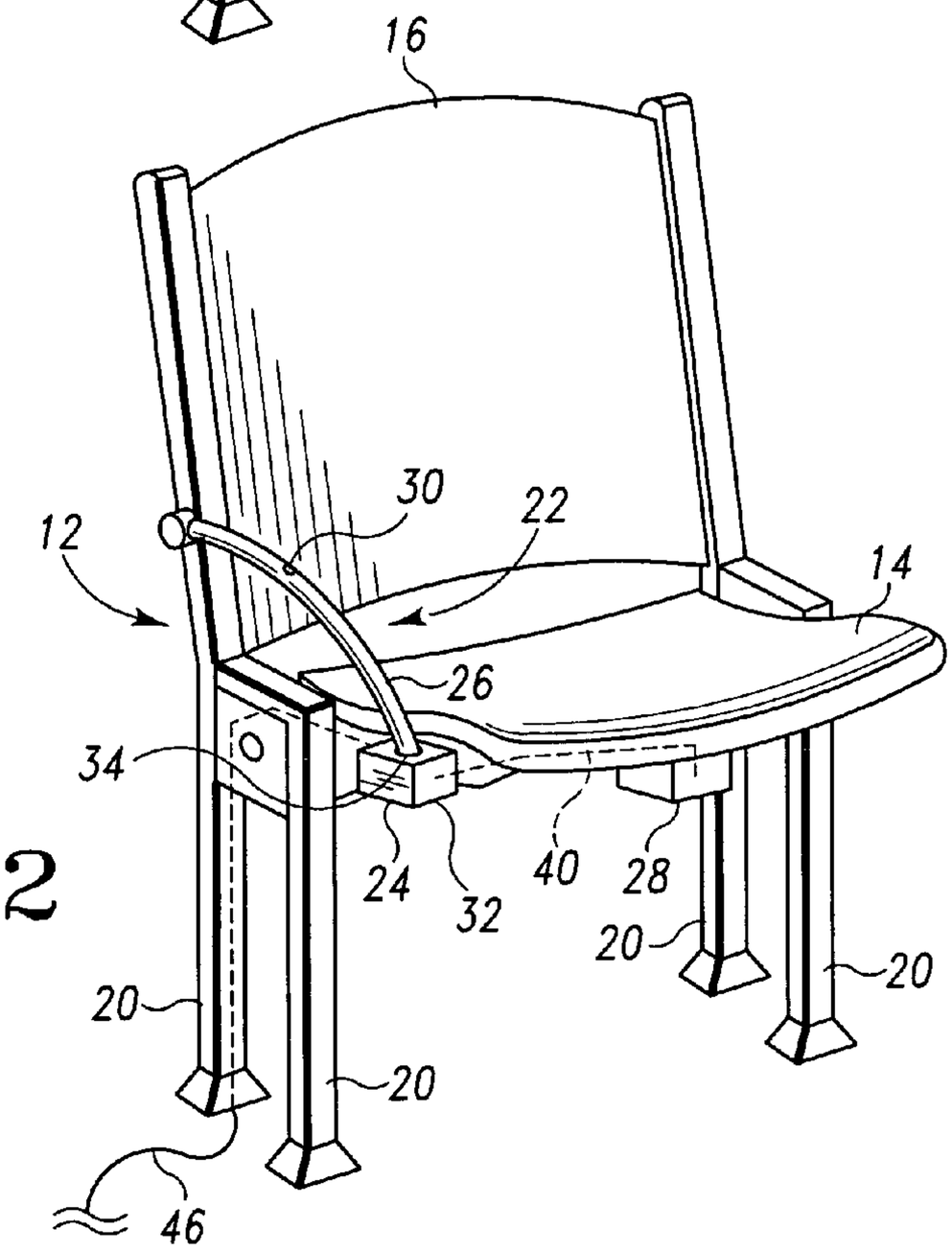
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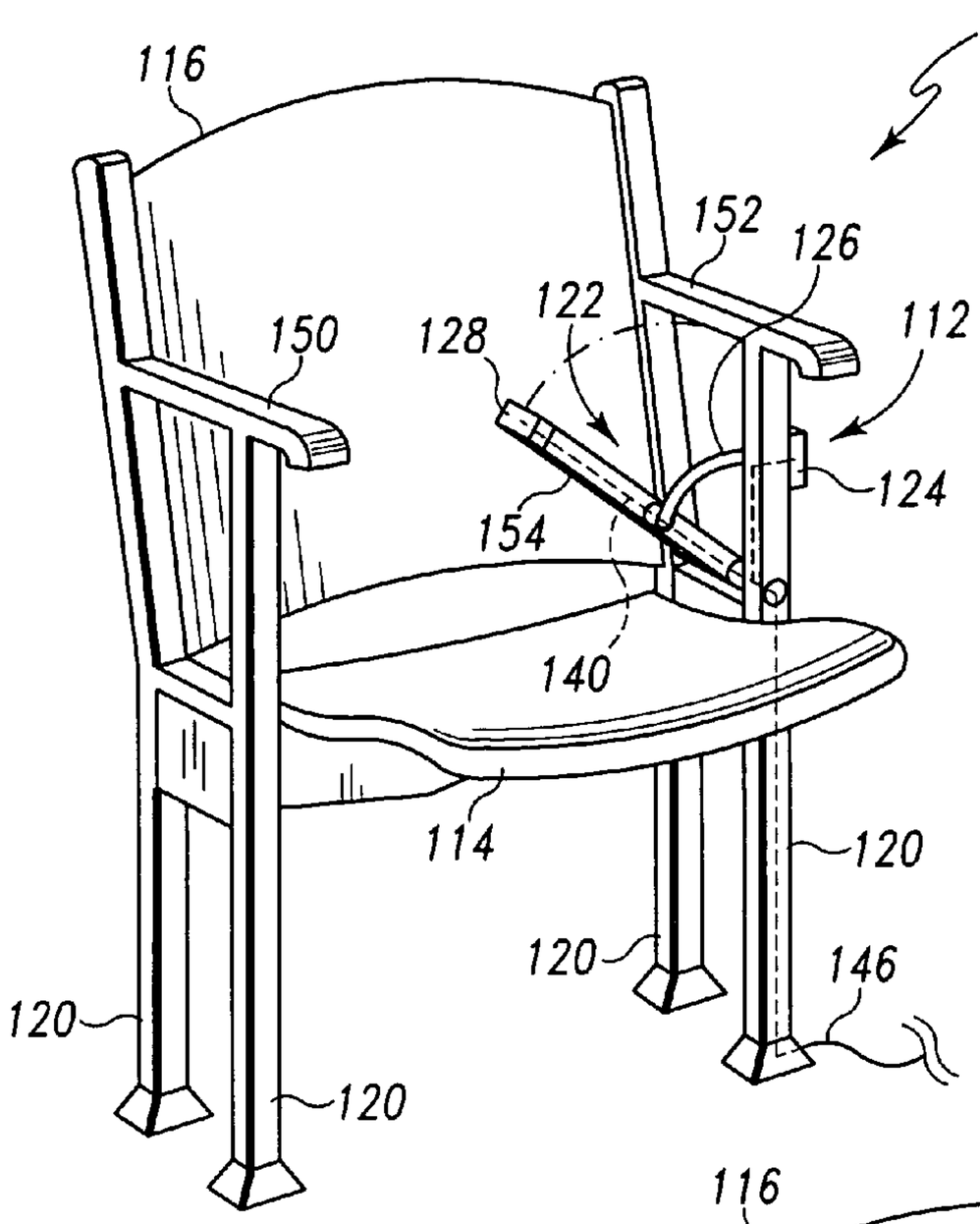
Fig. 2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116
152
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122
150
128
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124
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140
114
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146
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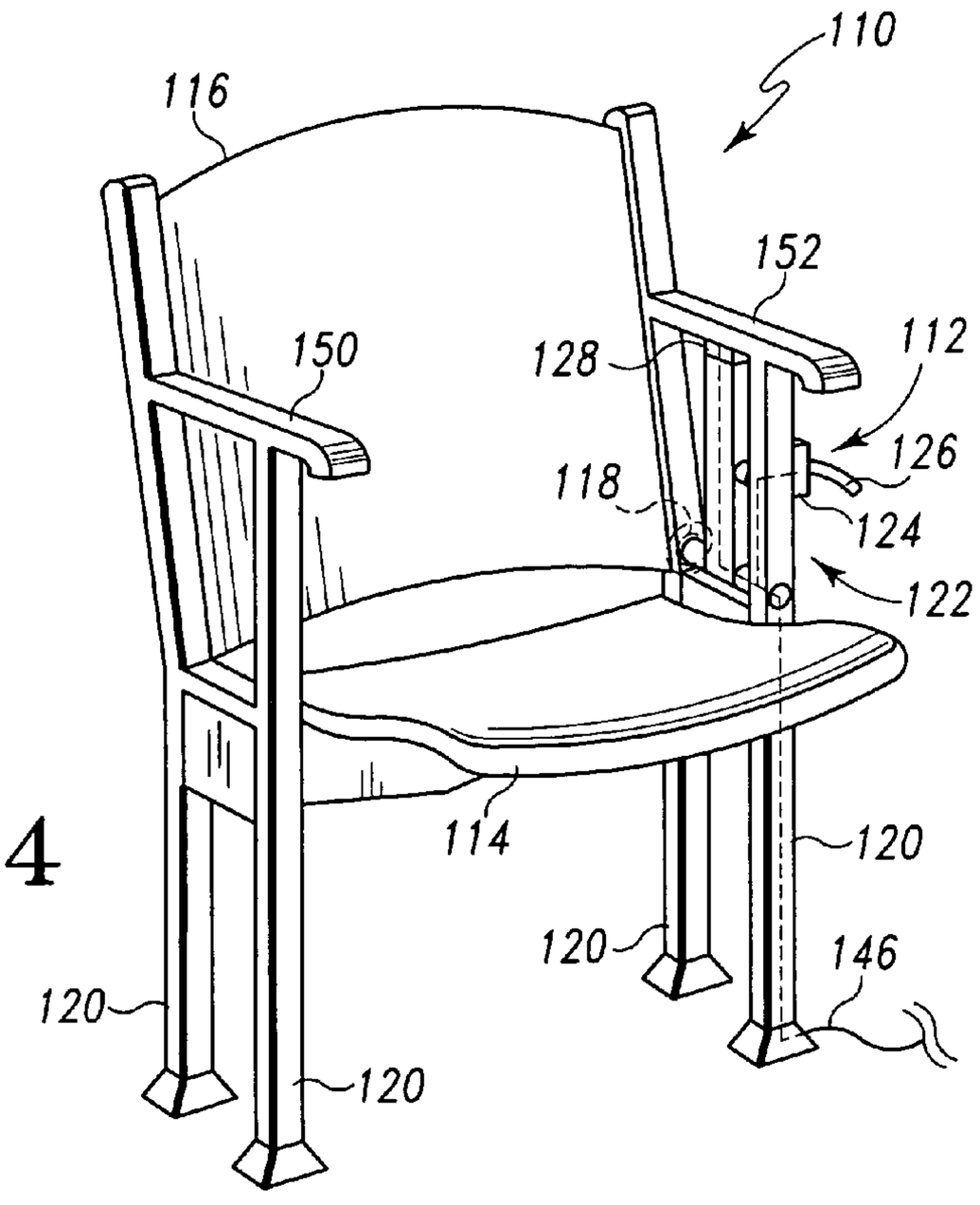
120

Fig. 3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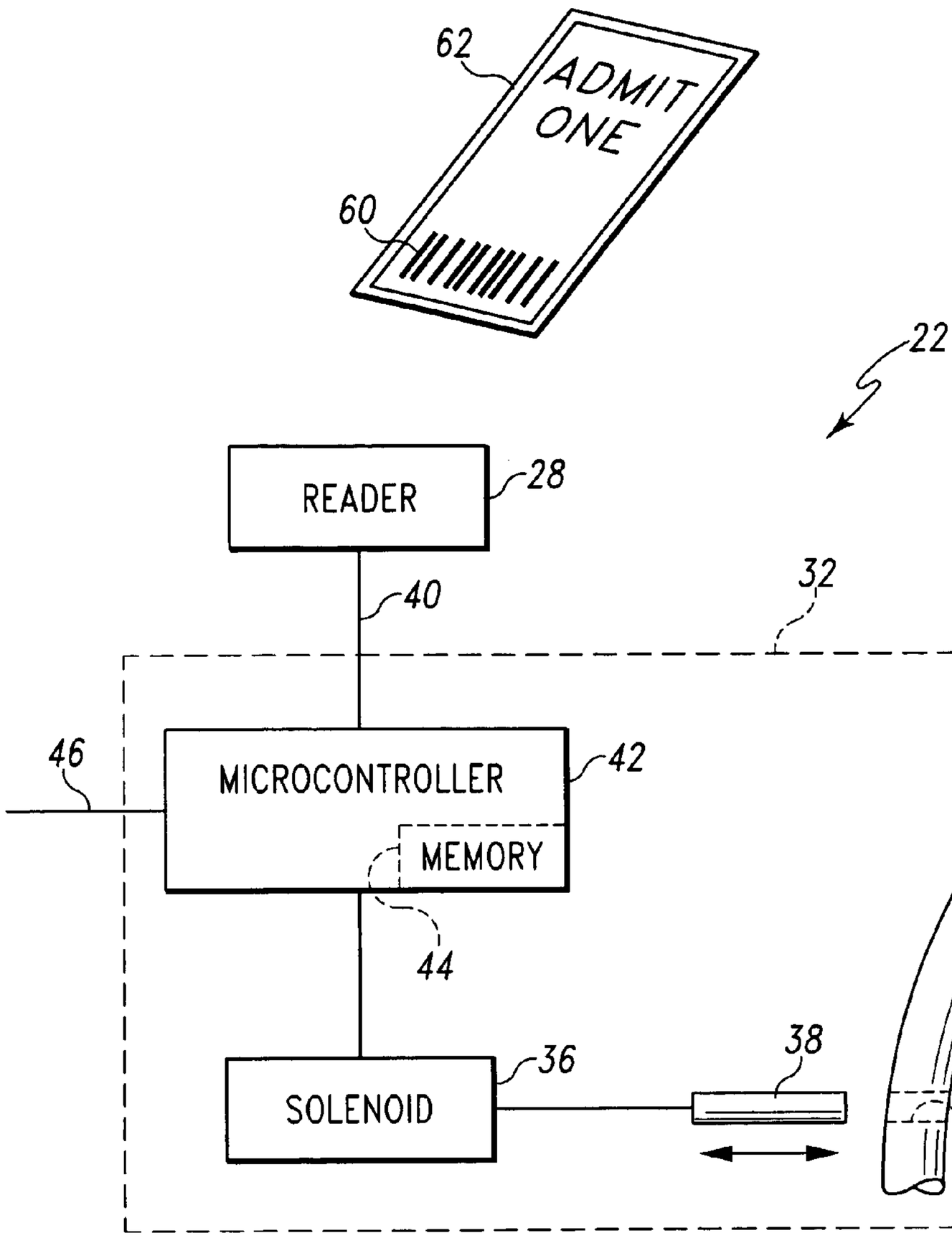
120

Fig. 4


62
ADMIT ONE
60
22
READER
28
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32
46
MICROCONTROLLER
42
MEMORY
44
SOLENOID
36
38
26
30

Fig. 5

SEAT LOCK

FIELD OF THE INVENTION

The present invention relates to seat locks, and in particular to a seat lock that inhibits an unauthorized person from occupying a seat.

RELATED APPLICATIONS

None.

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

None.

BACKGROUND OF THE INVENTION

At public events there are seats, or areas of seats, reserved for specific ticket holders. Many of these seats, if not all, are not secured to prevent a person from occupying a seat reserved for another. Thus, the actual ticket holder is put in the uncomfortable position of having to confront the person occupying the seat, and asking him or her to move.

The unique invention disclosed herein provides a solution to inhibit an unauthorized person from occupying a seat.

SUMMARY OF INVENTION

The present invention is directed to a device that inhibits an unauthorized person from occupying a seat. According to one aspect of the invention, a lock is operatively attached to the seat and back of a foldable chair to prevent unfolding of the chair. Further, an electronic means is operatively coupled to the lock wherein the lock allows the chair to unfold upon obtaining an input code that matches an unlock code.

According to another aspect of the invention, a blocking member is positioned to block a person from sitting in a chair. Further, an electronic means is provided for allowing, upon activation, the blocking member to be repositioned to unblock the person from sitting in the chair. The electronic means can be activated upon obtaining an input code that matches an activation code.

Other embodiments, systems, methods, features, and advantages of the present invention will be, or will become, apparent to one having ordinary skill in the art upon examination of the following drawings and detailed description. It is intended that all such additional systems, methods, features, and advantages included within this description be within the scope of the present invention, and be protected by the accompanying claims.

DESCRIPTION OF THE DRAWINGS

The invention may be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention. In the drawings, like reference numerals designate corresponding parts throughout the several views.

FIG. **1** is a perspective view of a foldable chair in a closed position with an apparatus in accordance with the present invention attached thereto;

FIG. **2** is the chair of FIG. **1** with the foldable chair in the open position;

FIG. **3** is a perspective view of another embodiment of a chair having an apparatus in accordance with the present invention attached thereto in an extended state;

FIG. **4** is the chair of FIG. **3** with the apparatus in accordance with the present invention in a retracted state; and,

FIG. **5** is a simplified partial schematic diagram of a locking system in accordance with the present invention.

DESCRIPTION OF DETAILED EMBODIMENTS

The following descriptions of detailed embodiments are for exemplifying the principles and advantages of the inventions claimed herein. They are not to be taken in any way as limitations on the scope of the inventions.

In the FIGURES, the following reference numbers are used to depict corresponding elements wherein reference numbers having the same last two digits correspond to like elements:

Reference Number	Element
10	foldable chair
12	locking system
14	chair seat
16	chair back
18	biasing mechanism
20	frame or support
22	lock
24	latch or catching mechanism
26	attachment member or arm
28	electronic reader (electronic means)
30	bore or notch
31	bore or notch
32	catching mechanism housing
34	bore extending through housing
36	solenoid (electronic means)
38	pin
40	signal path
42	microcontroller (electronic means)
44	memory
50	armrest
52	armrest
54	blocking member or barrier
56	rectangular panel
58	biasing member
60	magnetic strip or bar code
62	ticket

As used herein and in the claims, the term "electronic means" includes structure comprising at least one of the following: an electronic reader, a solenoid, and/or a microcontroller.

Turning to FIGS. **1** and **2**, a foldable chair **10** is depicted having a locking system **12** in accordance with the present invention. The chair **10** includes a seat **14**, a back **16**, a conventional biasing mechanism **18**, and support or frame **20**. The frame **20** can include a plurality of legs attached to a fixed surface such as a floor or other fixed structure. The seat **14** and the back **16** of the chair **10** are operatively attached to the frame **20** in a conventional manner whereby, when the folding seat is opened (FIG. **2**), the seat provides a platform for a person to sit and the back provides the sitting person with back support. Likewise, when the chair **10** is closed (FIG. **1**) the seat **14** and the back **16** approach each other so that the seat **14** is not readily assessable for sitting.

The chair **10** can be installed or mounted in a stadium, arena, theater, or other venue wherein seats are leased for

attending an event. Typically, but not necessarily, the patrons purchase a ticket for the event with the location of the seat printed on the ticket.

The biasing mechanism **18** is operatively attached in a conventional manner to the seat **14** to move the seat towards the back **16**, and thus into the closed position (i.e., FIG. **1**) when the seat is not occupied. The biasing mechanism **18** can comprise a spring or other conventional means for biasing the chair into a closed position when it is not occupied.

In an embodiment, the locking system **12** includes a lock **22** and an electric reader **28**. The lock **22** includes a latch or catching mechanism **24** and an attachment member or arm **26**. Preferably, but not necessarily, the catching mechanism **24** is attached (e.g., bolts, rivets or other conventional means) to the seat **14** and the attachment member **26** is attached (e.g., bolts, rivets or other conventional means) to the back **16** or frame **20**. The attachment member **26** can be a straight or curvilinear bar or rod with a notch or bore **30** for receiving a locking pin **38** (FIG. **5**) as described below.

Accordingly, the locking mechanism **24** includes a metal or metal alloy housing **32** with a bore **34** extending therethrough. Turning to FIG. **5**, also contained within the housing **32** is a solenoid **36** and a pin **38** or the like that is received within the notch **30** of the attachment arm **26** when the chair is in a locked position. The solenoid **36** is operatively coupled to the pin **26** for moving the pin **38** into, and out of, engagement with the notch **30** in the attachment arm, and thus locking and unlocking the position of the seat **14**.

Preferably, but not necessarily, the reader **28** can be a conventional bar code reader, magnetic strip reader, or radio frequency identification (RFID) reader. The reader **28** can be connected to the chair **10**, such as the underneath portion of the seat **14** by conventional means such as, but not limited to, bolts or rivets. The reader **28** is operatively connected to the lock **22** by a signal path **40** for providing a signal to the lock that contains the data (i.e., input code) read by the reader from a magnetic strip or bar code **60** located on a ticket **62** or from an RFID tag (not shown).

In an embodiment, the lock **22** can include a microcontroller **42** or other computer means for comparing the input code, read from the ticket, with an access code. Accordingly, the microcontroller can have a non-volatile memory **44** for storing the access code. If the input code matches the access code, then the microcontroller **42** sends a signal to unlock the lock wherein the pin **38** is removed from the bore **34** in the attachment member or arm **26**. Thus, when the lock is unlocked, the chair **10** can be unfolded and the seat occupied.

The microcontroller **42** can be operatively connected to a remote computer (not shown) or the like, via a signal path **46**. In an embodiment, the central computer can remotely unlock, lock, and change the access code stored by the lock memory **44**. In yet another embodiment, the microcontroller **42** can be replaced by the central computer wherein the central computer receives the input code from the reader **28**, compares the input code to an access code for the chair **10**, and sends a command to unlock the chair if the input code read from the ticket **62** matches the access code for the chair.

In another embodiment, the chair **10** can receive a signal from a remote computer to unlock the chair once the corresponding ticket holder has entered the venue (i.e., stadium, arena, theater, or other venue wherein seats are leased for attending an event). Accordingly, an electronic reader can be located at an entrance to the venue wherein, upon reading the seat location of the ticket holder, a signal is generated to unlock the chair **10** associated with the ticket holder.

As will be appreciated by those having ordinary skill in the art, the electronics mounted to or about the chair are powered by an alternating current source, a solar energy cell mounted to the seat and/or back of the chair, a battery, or the like.

Turning to FIGS. **3**–**4**, another embodiment of a chair **110** is depicted having an apparatus **112** in accordance with the present invention attached thereto. The chair **110** includes a seat **114**, a back **116**, and armrests **150** and **152**. In an embodiment, the seat **114** and back **116** are fixedly secured in relation to each other in a conventional manner. Accordingly, the seat **114** provides a platform for a person to sit and the back **116** provides the sitting person with back support. Moreover, the armrests **150**,**152** provide support for the sitting person's arms.

The locking system **112** includes a lock **122**, an electronic reader **128**, and a blocking member or barrier **154**. In an embodiment, the blocking member **154** is a rectangular panel that is pivotally mounted to the chair **110** about the seat **114** and one of the armrests **150**,**152**.

Preferably, the blocking member **154** can pivot such that in one position (FIG. **3**), the blocking member **154** prevents the seat **116** from being readily assessable for sitting. Likewise, when the blocking member **154** is pivoted to another position (FIG. **4**), the seat **114** is readily accessible. A coil spring **118** or other biasing means is provided to urge the blocking member into the position shown in FIG. **3**.

The lock **122** includes a latch or catching mechanism **124** and an attachment member or arm **126**. Preferably, but not necessarily, the catching mechanism **124** is fixedly secured to the seat, armrest, and/or frame **120** of the chair. The attachment member **126** is attached to the blocking member **154** and can be a curvilinear metal, or metal alloy, rod or strip having one or more openings or notches for mating with a locking pin **38** (FIG. **5**) as described in detail further herein.

Accordingly, the catching mechanism **124** includes a housing **132** containing a solenoid **36** (FIG. **5**) and a pin **38** (FIG. **5**) that can be received within the opening **30** (FIG. **5**) in the attachment member or arm **126**. Further, the solenoid **36** is operatively coupled to the pin **126** for moving the pin **38** into, and out of, engagement with the opening in the attachment arm **126**.

In an embodiment, the reader **128** is attached to the non-pivoting end of the blocking member **154**. As stated previously, the reader **128** can be a conventional bar code reader, magnetic strip reader, or radio frequency identification (RFID) reader. The reader **128** is operatively connected to the lock by a signal path **140** for providing a signal to the lock that contains the data (i.e., input code) read by the reader from a bar code or magnetic strip on a ticket or the like such as an RFID tag.

As stated previously, the lock **122** can include a microcontroller or other computer means for comparing the input code with an access code. Accordingly, the microcontroller can have a non-volatile memory for storing the access code. If the input code matches the access code, then the microcontroller sends a signal to unlock the lock wherein the pin **126** is removed from the opening **30** in the locking mechanism **124**. Thus, when the lock is unlocked, the blocking member **154** can be moved to provide access to the seat. Further, when the blocking member **154** is moved out of the way, the microcontroller can command the pin **126** into another opening (not shown) in the attachment arm **126** to

prevent the blocking member **154** from moving back into the extended state (i.e., the state depicted in FIG. **3**).

It should be emphasized that the above-described embodiments of the present invention, particularly, any "preferred" embodiments, are possible examples of implementations merely set forth for a clear understanding of the principles of the invention. Many variations and modifications may be made to the above-described embodiment(s) of the invention without substantially departing from the spirit and principles of the invention. All such modifications are intended to be included herein within the scope of this disclosure and the present invention, and protected by the following claims.

What is claimed is:

1. An apparatus comprising:

a lock operatively attached to a chair to prevent unfolding of the chair;

an electronic means operative coupled to the lock wherein the lock allows the chair to unfold upon obtaining an input code that matches an unlock code; and,

wherein the chair is installed within a stadium, arena or theater.

2. The apparatus of claim **1**, the electronic means comprising a magnetic strip reader or a barcode scanner.

3. The apparatus of claim **1**, the electronic means comprising a radio frequency identification reader.

4. The apparatus of claim **1**, wherein the electronic means is connected to a remote computer for sending the input code.

5. The apparatus of claim **4**, wherein the computer sends the input code upon receiving a signal from a venue entry point.

6. The apparatus of claim **5**, wherein the venue entry point is an entrance to the stadium, arena, or theater.

7. The apparatus of claim **1**, wherein the electronic means is powered by an alternating current source, solar energy, or a battery.

8. An apparatus to prevent a person from comfortably sitting comprising:

a blocking member positioned to block the person from comfortably sitting in a chair having a seat;

an electronic means for allowing, upon activation, the blocking member to be repositioned to unblock the person from comfortably sitting in the seat, the electronic means being activated upon obtaining an input code that matches an activation code; and,

wherein the chair is installed in a stadium, arena or theater.

9. The apparatus of claim **8**, the blocking member comprising an armrest.

10. The apparatus of claim **8**, the blocking member comprising a retractable bar.

11. The apparatus of claim **8**, the electronic means comprising a magnetic strip reader, a barcode scanner, or a radio frequency identification reader.

12. The apparatus of claim **8**, wherein the electronic means is connected to a remote computer for sending the input code.

13. The apparatus of claim **12**, wherein the computer sends the input code upon receiving a signal from a venue entry point.

14. The apparatus of claim **13**, wherein the venue entry point is an entrance to the stadium, arena, or theater.

15. The apparatus of claim **8**, wherein the electronic means is powered by an alternating current source, solar energy, or a battery.

16. An apparatus comprising:

a lock operatively attached to a chair to inhibit occupancy of the chair when the lock is locked;

a reader for reading a code; and,

wherein the lock is unlocked if the code is for unlocking the chair wherein the chair is installed in a stadium, arena or theater.

* * * * *